REMARKS

In the Office Action Claims 1-5, 7-11 and 16-17 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,027,410 to Williamson et al. ("Williamson"). Claim 6 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Williamson in view of U.S. Patent No. 6,195,438 to Yumoto et al. ("Yumoto"). Claims 12-15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Williamson in view of U.S. Patent No. 5,404,315 to Nakano et al. ("Nakano"). Claims 18-24 and 26-29 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Williamson in view of U.S. Patent No. 5,404,315 to Fischer et al. ("Fischer"). Claims 25 and 30 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Williamson in view of Fischer and further in view of Nakano. Claim 10 is amended to correct dependency. Claims 31-34 are new.

The §102 Rejections

Williamson does not teach a transform engine or a compander as required by the claims of the present Application. Instead, Williamson teaches a spectral filter which determines gain for different frequency bands (Williamson col. 8, lines 6-20). Williamson never mentions a compander and teaches only a limited operation multiband filter that operates as a multiband compressor having linear and compression segments. Filter gains for frequency bands in Williamson's spectral filter are controlled by summing noise level estimates to predetermined user specific spectral shaping (col. 10, lines 48-65). For the sake of computational efficiency, this calculated filter "is the only operation on the audio signal in the path from input to output." *Id.* In, Williamson only the modification of position of a single knee point (K1) is taught and modification is based on noise level (i.e. a noise floor) summed with a predetermined offset value. Williamson explicitly teaches that second knee K2 and the slopes of gain function segments remain fixed (Williamson at col. 12, line 55-col. 13, line 8).

No transform engine responsive to user input and controlling a compander is taught in Williamson. Rather, Williamson teaches individual filter control for adjusting filter gains based on the noise floor. User input in Williamson is obtained during a fitting process and through user manipulation of a volume control dial located on an earpiece where the dial is used to control overall volume level (col. 7 line 65 – col. 8 line 5, and col. 5, lines 66-67). In contrast, each of claims 1-5, 7-11 and 16-17 requires a system volume control for setting system gain and at least one transform engine responsive to at least one user-set parameter for

controlling operation of the compander and setting the system volume control. As recited in claims 2 (as amended), 30 and 31 and 16, the required transform engine responds to user-set parameters including user volume control, user minimum output level, source dynamic range, and a user interface for establishing user-set operation, set-up and configuration commands. Williamson teaches no transform engine responsive to any of these user-set parameters and does not teach minimum output level or source dynamic range. Claim 3 requires that the transform engine can control the operation of the compander by setting kneepoints, attack and release parameters, gain calculation coefficients, and zero dB offset values. Williamson teaches no transform engine that sets these parameters, coefficients or values.

Regarding volume control, Williamson explicitly teaches that the user directly controls overall volume level (col. 5, lines 66-67). However, the rejected claims require a transform engine for controlling operation of the compander and setting the system volume control. Nothing in Williamson teaches or suggests a transform engine that controls a compander and sets system volume. Williamson teaches direct control of overall volume and a "Power Amp. And Volume Control 39" element in an earpiece that is separate and distinct from a processor used to implement a spectral filter (*See* Williamson Fig. 2 and associated text). This local volume control is not connected to Williamson's processor and therefore could not be used in any computations of the processor. Consequently, Williamson fails to teach setting of system volume control and system gain by a transform engine as required in the rejected claims.

Even if the spectral filter of Williamson could be characterized as a compander and Williamson's processor could be misconstrued as a transform engine, claims 4 and 5 are improperly rejected for the additional reason that Williamson does not teach a plurality of spectral filters or a plurality of processors. Claims 4 and 5, of the present application require a plurality of companders and claim 5 requires a plurality of transform engines.

Because Williamson fails to teach every element of the rejected claims, the rejections are improper and should be withdrawn.

The §103 Rejections

Yumoto does not cure the deficiencies of Williamson including those that were identified *supra*. Yumoto is cited for the proposition that an audio leveling apparatus 22 renders obvious the power estimator mixer responsive to a plurality of companders as required by claim 6 and which is not taught by Williamson. Applicants respectfully disagree with this proposition because Yumoto does not even teach such a power estimator. Further, no motivation would have existed to combine Yumoto with Williamson and no expectation of success could have been anticipated. Neither Yumoto nor Williamson teaches a plurality of companders and Yumoto is completely silent regarding power estimation. Further, Williamson teaches a user operated volume control located in an earpiece for controlling overall volume level and a maximum power output ("MPO") element 37 is located in the earpiece and configured to a user during fitting (col. 5, lines 66-67 and Fig 2). The MPO is clearly located in an earpiece that is separate and distinct from a processor used to implement a spectral filter (*See* Williamson Fig. 2 and associated text). Since Williamson already teaches a maximum power control element customized to a user and a user override volume control, the addition of Yumoto's audio leveler in Williamson's processor would have been redundant and considered unnecessary by one of ordinary skill in the art. Consequently no motivation for combining the references or expectation of success could have been existed. For at least these reasons, the rejection of claim 6 should be withdrawn.

Nakano does not cure the deficiencies of Williamson including those identified *supra*. Nakano merely teaches the sampling of sound signals and maintaining a histogram of frequency distribution of amplitudes of the sound signals (col. 7, lines 42-51). However, claims 12-15 require a statistics engine for monitoring at least one compander operating parameter and for generating a histogram in accordance with the monitored compander operating parameter. Nakano is silent regarding companders and, consequently, the combination of Williamson with Nakano cannot reasonably be said to render obvious the claims since it would not have been obvious to monitor operating parameters of companders when neither operating parameters nor companders was taught in the references.

Claim 13 additionally requires the monitoring of at least one operating parameter of an input level adjuster that is responsive to an input signal. Claim 14 requires an analysis engine for analyzing the histogram and generating a control signal in accordance therewith, to which the compander is responsive. Claim 15 additionally requires an analysis engine for

analyzing the histogram and generating a control signal to which an input level adjuster is responsive. Neither Nakano nor Williamson teaches or suggests the measurement of operating parameters of companders or input level adjusters or the generation of control signals for the companders and input level adjusters. Thus, absent hindsight, no motivation could have existed to modify the references to produce the claimed statistics engine and analysis engine.

Furthermore, Williamson is concerned only with measurement of changes in noise floor and Nakano's histograms would have produced negligible benefit in measuring a noise floor. Williamson is expressly concerned with computational efficiency and minimizing the number of operations performed on audio signals and the production of statistics (col. 10, lines 48-65). Consequently, one of ordinary skill in the art would not have been motivated to combine Nakano's histogram generation in a hearing aid to obtain questionable benefit while incurring significant processing overhead. Therefore, for at least these reasons, the rejections of claims 12-15 should be withdrawn.

Fischer does not cure the deficiencies of Williamson including those identified *supra*. Applicants note that the arguments presented in response to the §102 rejections apply to the rejections of claims 18 and 19 and that these claims are also allowable for at least these same reasons. Additionally, the Office Action cites Fischer as supplying a noise extractor that is required by claims 18-24 and 26-29 and the Office Action suggests that the Williamson and Fischer could have rendered the claims obvious. However, Fischer teaches an adaptive beam former in which gain factors are generated and applied to weighting amplifiers to suppress noise in signals received from directional microphones (col. 3, lines 25-35). However, claims 18-24 and 26-29 of the present Application require that a compensation input be generated from an environmental input and a reference signal (or a system output). A volume control is required for establishing an offset to system gain from the compensation input. Thus, as claimed, noise is not suppressed, but extracted and measured so that output signal power can be adjusted to dominate noise in the environment. Fischer does not teach the use of the reference signal or the use of a reference signal, including a system output signal. Furthermore, Williamson is expressly concerned with computational efficiency and minimizing the number of operations performed on audio signals (col. 10, lines 48-65). Consequently, one of ordinary skill in the art would not have been motivated to combine

Fischer with Williamson as proposed by the Examiner. Therefore, for at least these reasons, the rejections of claims 18-24 and 26-29 should be withdrawn.

Regarding the rejections of claims 25 and 30, Applicants refer the Examiner to the §103 arguments supra for the combinations of Williamson and Fischer and Williamson and Nakano.

The New Claims

Claims 31-34 have been added. These claims further limit embodiments of the invention and include no new matter.

CONCLUSION

All objections and rejections having been addressed, and in view of the foregoing, all remaining claims are believed to be in form for allowance, and such action is hereby earnestly solicited. The Examiner is kindly requested to contact the undersigned at the telephone number listed below if any points remain in issue which may be best resolved through a personal or telephone interview. Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,
PILLSBURY WINTHROP SHAW PITTMAN LLP

ANTHONY G. SMYTH
Reg. No. 55636
Tel. No. 858 509.4007
Fax No.

Date: April 5, 2006
2475 Hanover Street
Palo Alto, CA 94304-1114
(650) 233-4500

CERTIFICATION UNDER 37 C.F.R. §§ 1.8 and/or 1.10*

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